

REMARKS

I. Introduction

In response to the final Office Action, Applicants have amended claims 1 and 7 in order to further clarify the subject matter of the present disclosure. Support for these amendments may be found, for example, in paragraphs [0214], [0339], [0514], [0530] and [0665] of the specification. Applicants have taken care to avoid the introduction of new matter.

A Request for Continued Examination (RCE) is being filed concurrently herewith.

Applicants respectfully submit that all pending claims are patentable over the cited prior art for the reasons set forth below.

II. The Rejection Of Claims 1-10 Under 35 U.S.C. § 103

Claims 1-10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsumoto (Akira) (JP 62-190660) in view of Jia et al. (US 2003/0224226). Applicants respectfully traverse this rejection for at least the following reasons.

As a preliminary matter, the Examiner has failed to discuss any rejection of claim 11 in the remarks of the Office Action. Accordingly, Applicants presume that claim 11 is allowable and patentable, and an indication of such is respectfully solicited.

Amended independent claim 1 recites, in part, a fuel cell system comprising a control means which controls the fuel gas supplying means, the oxidizing agent gas supplying means and the raw material gas supplying means such that during the starting of electricity generation of the fuel cell, the raw material gas supplying means purges at least the cathode side with the raw material gas, in which a sulfur compound is removed, before the fuel gas supplying means

and the oxidizing agent gas supplying means supply the fuel gas and the oxidizing agent gas to the fuel cell, respectively.

In addition, amended independent claim 7 recites a method of starting a fuel cell system comprising a fuel cell which generates electric power from a fuel gas and an oxidizing agent gas, a fuel gas supplying means which supplies the fuel gas to an anode side of the fuel cell, and an oxidizing agent gas supplying means which supplies the oxidizing agent gas to a cathode side of the fuel cell, comprising: a purging step of purging, during the starting of electricity generation of the fuel cell, at least the cathode side with a raw material gas to be used in the production of the fuel gas, in which a sulfur compound is removed, before the fuel gas and the oxidizing agent gas are supplied to the fuel cell.

One feature of the present disclosure is that the fuel cell system or the method of starting the fuel cell system has a raw material gas supplying means which purges, at least the cathode side with the raw material gas, in which a sulfur compound is removed, before gas supplying means supply gas to the fuel cell. Since sulfur compounds, such as odorizers, can act as catalyst poisons which inhibit the reaction at the fuel cell, it is desirable to remove sulfur compounds before they are supplied to the fuel cell. Further, since a raw material gas is used during the purge, a fuel cell system that prevents the acceleration of drying of the electrolyte membrane is obtained.

It is asserted by the Examiner that Matsumoto (Akira) teaches a fuel cell system, having a raw material gas valve and that the cathode side is purged with a raw material gas (see, page 8, ¶ 1 of Matsumoto (Akira)). As with the previous Office Action, this Office Action is silent with regard to the specific limitations of claims 1 and 7. Presumably, the above assertion is made to suggest that Matsumoto (Akira) teaches that a raw material gas supplying means purges at least

the cathode side with the raw material gas before the fuel gas supplying means and the oxidizing agent gas supplying means supply the fuel gas and the oxidizing agent gas to the fuel cell (claim 1), AND a purging step of purging, during the starting of electricity generation of the fuel cell, at least the cathode side with a raw material gas to be used in the production of the fuel gas, before the fuel gas and the oxidizing agent gas are supplied to the fuel cell (claim 7). Applicants respectfully disagree.

Matsumoto (Akira) teaches that a natural gas in the oxidizing agent chamber is purged with a combustion gas during re-starting. This is stated clearly in the Abstract of Matsumoto (Akira) which states, “by switching a four-way valve 21, a combustion gas is supplied to a pipeline 10 from a pipeline 19. After the whole gas in an oxidizing agent chamber 5 is replaced with the combustion gas...” Thus, it is clear that, instead of using a raw material gas used in the purge, a combustion gas generated from the raw material gas is used. Since the combustion gas, once converted from the raw material gas is no longer a raw material, it cannot be said that Matsumoto (Akira) teaches a step of purging, during the starting of electricity generation of the fuel cell, at least the cathode side with a raw material gas to be used in the production of the fuel gas. Moreover, there is no mention at all whether the raw material gas is used that has had sulfur removed before the purge step. Thus, Matsumoto also fails to teach or suggest that purging with a raw material gas to be used in the production of the fuel gas, in which a sulfur compound is removed.

In contrast, the present disclosure teaches, in paragraph [0388], that if a combustion gas, such as hydrogen gas, is used to purge the interior of the fuel cell, local combustion may occur when electricity generation begins. As such, the present disclosure uses raw material gas, in which sulfur has been removed, to prevent such an occurrence. In view of the above, it is clear

that Matsumoto (Akira) fails to disclose all of the limitations of claims 1 and 7 of the present disclosure.

Moreover, Jia fails to remedy this deficiency. Jia teaches that the cathode is exposed to a reductant, such as hydrogen. As such, any purge step of Jia would involve purging with a fuel gas, not a raw material gas. Accordingly, the combination of Matsumoto (Akira) and Jia fails to teach or suggest all of the limitations of claims 1 and 7 of the present disclosure.

Therefore, as is well known, in order to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. Matsumoto (Akira) and Jia fail to teach or suggest a fuel cell system having a raw material gas supplying means purges at least the cathode side with the raw material gas, in which a sulfur compound is removed; OR a method of starting a fuel cell system involving purging the cathode side with a raw material gas to be used in the production of the fuel gas, in which a sulfur compound is removed. Therefore, as it is apparent from the foregoing that Matsumoto (Akira) and Jia fail to render amended claims 1 and 7 or any dependent claims thereon, obvious, Applicants respectfully request that the § 103 rejection of claims 1 and 7 be withdrawn.

**III. All Dependent Claims Are Allowable Because The
Independent Claim From Which They Depend Is Allowable**

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*, 819 F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as independent claims 1 and 7 are patentable for the reasons set forth above, it is respectfully submitted that all pending dependent claims are also in condition for allowance.

IV. Conclusion

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication of which is respectfully solicited.

If a new Office Action is to be issued, Applicants respectfully request that the Examiner provide reference numerals for elements of each of the claims as they appear in the cited prior art.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP



Nathaniel D. McQueen
Registration No. 53,308

600 13th Street, N.W.
Washington, DC 20005-3096
Phone: 202.756.8000 NDM:MWE
Facsimile: 202.756.8087
Date: November 30, 2010

**Please recognize our Customer No. 53080
as our correspondence address.**